



## **Costal Surface Water Sampling and Analysis Plan**

MC 252 Oil Platform  
Crude Oil Spill

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***Prepared For:***

Incident Command

***Prepared By:***

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## **1.0 Introduction and Purpose**

This Work Plan was prepared by Center for Toxicology and Environmental Health, L.L.C. (CTEH), on behalf of Incident Command, and describes the sampling and analysis activities proposed to evaluate crude oil releases to surface water. According to reports, an unspecified amount of crude oil was released from the MC 252 platform subsequent to the failure of that structure. Current estimates indicate a loss of up to 200,000 gallons from this location on a daily basis. Some of this oil has the potential to reach the shoreline of the Gulf of Mexico (Gulf) in areas from Venice, LA to Pensacola, FL.

The purpose of this sampling and analysis plan (SAP) is to guide surface water sampling of the Gulf coastline to determine whether or not the surface water is affected by the crude oil spill and evaluate water quality. Sample locations will be identified in a separate deliverable. Sampling areas may be expanded, as needed, to identify other sources.

Surface water samples will be analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), gasoline range organic compounds (GRO), diesel range organic compounds (DRO), oil range organic compounds (ORO), Target Analyte List (TAL) metals, and mercury. This plan will officially be implemented after approval by USEPA and State Regulators, however, in practice this plan will be implemented immediately based on earlier efforts and communications with USEPA and State Regulators.

## **2.0 Sampling, Methods, and QA/QC Documentation**

The data quality objectives for this surface water sampling plan are provided in Attachment 1.

### **2.1. Sampling Locations**

The sampling strategy set forth below was established to evaluate the potential for crude oil or its degradation components to affect water quality along the Gulf coast from Louisiana to Florida.

Sampling locations are currently being established with input from the USEPA, the US Coast Guard, and State Health Departments for Mississippi, Louisiana, Alabama and Florida, evaluating areas from a western boundary at Venice, LA to an eastern limit at

Pensacola, FL. An addendum to this plan will be filed with the names, locations and descriptions of the locations identified for testing.

Periodic sampling at intervals agreed to by Incident Command, State Health Departments, and USEPA will be conducted for each identified location. When possible, a regular sampling schedule will be established. Additional targeted surface water samples may be collected as requested by Incident Command. The data obtained from all sampling, along with any significant field observations from the collection points (e.g. odor) will be provided to Incident Command and USEPA. Of particular interest in field observations are indications of oil or oil impact to areas where sampling is being conducted including evidence of impact prior to the potential for impact from the MC 252 event.

## **2.2. Chemical and Field Sampling Procedures**

Field teams, composed of CTEH personnel and designates, will be deployed with appropriate equipment and supplies to collect surface water quality samples. All sampling will be documented in field notebooks and/ or with hand-held data collectors. Locations of surface water samples will be documented with Global Positioning System (GPS) receivers. All sampling and subsequent shipping and handling of samples will be carried out following strict chain-of-custody procedures and methodology appropriate for the media and conditions.

Surface water samples intended for analysis of semi-volatile organic chemicals (SVOC) will be collected in a 1-L pre-cleaned amber glass bottle (or equivalent) and analyzed using EPA SW846 Method 8270.

Surface water samples intended for analysis of volatile organic chemicals (VOC) will be collected in preserved (HCl) 40-mL volatile organic analysis (VOA) vials for VOC analysis using EPA SW846 Method 8260. Three vials will be collected for each water sample.

One 1-Liter amber glass bottle (unpreserved) will be collected for DRO and ORO analysis by EPA SW846 Method 8015B.

Surface water samples intended for analysis of gasoline range organic chemicals (GRO) will be collected in preserved (HCl) 40-mL volatile organic analysis (VOA) vials for analysis using EPA SW846 Method 8015. Three vials will be collected for each water sample.

Surface water samples intended for analysis of Target Analyte List (TAL) metals and mercury will be collected in a preserved (HNO<sub>3</sub>) 150-mL poly bottle for metals analysis. TAL metals will be analyzed by EPA SW846 Method 6010; mercury by EPA SW846 Method 7470.

### **2.3. Field Quality Control**

Field sampling will be carried out in conjunction with a well defined quality control (QC) program. The goal of the field QC program is to document that samples are collected without the effects of accidental cross- or systematic contamination. The following QC samples will be obtained in the field at prescribed intervals:

### **2.4. Field Sample Duplicates**

One (1) duplicate field sample for metals, semi-volatile, volatile, GRO, and DRO/ORO will be collected for every 50 field samples and/or every day sampling is performed to document the reproducibility of sampling efforts.

### **2.5. Blank Analysis**

For metals, semi-volatile, volatile, GRO, and DRO/ORO analysis, a method blank will be prepared per method with samples and analyzed per method at the laboratory. Trip blanks for VOAs will be collected.

### **2.6. Field Sample Preservation and Shipping**

Immediately after collection, field samples will be stored on blue ice or wet ice, and maintained at 4°C +/- 2°C during field storage and transshipment to the laboratory.

### **2.7. Holding Times**

The following holding times will be followed in this investigation.

- *Semi-volatile organic compound and DRO/ORO analysis (water):*  
14 days from collection to extraction.  
40 days from extraction to instrumental analysis.

- *Volatile organic compound and GRO analysis (water)*  
7 days from collection to analysis.
- *TAL Metals (water)*  
28 days from collection

## **2.8. Analytical Laboratory**

Water quality samples will be delivered to Gulf Coast Analytical Laboratories. Other analytical laboratories with facilities in the region may be used as required based on the number of samples collected on a daily basis, in order to maintain adequate turn-around times for data. Only pre-approved and accredited laboratories will be used for testing. Other available laboratories include Accutest Laboratories, Pace Analytical, and Test America. All are NELAC accredited laboratories.

Samples will be shipped by overnight courier to:

Gulf Coast Analytical laboratories  
7979 GSRI Avenue  
Baton Rouge, LA 70820  
(225) 214-7077

Other laboratory addresses are available on request.

### ***Sample Preparation***

Water samples will be prepared for SVOC and TPH (DRO/ORO) analysis by liquid-liquid extraction, EPA SW846 Method 3510.

Water samples will be prepared for VOC and GRO analysis by purge and trap vapor collection, EPA SW846 Method 5030.

Water samples will be prepared for TAL metals analysis by acid digestion.

### ***Instrumental Analysis***

**Total Petroleum Hydrocarbons:** Sample extracts will be analyzed for DRO and ORO by EPA SW848 Method 8015, *Nonhalogenated Organics by Gas Chromatography*.

**Total Petroleum Hydrocarbons:** Sample extracts will be analyzed for GRO by EPA SW848 Method 8015, *Nonhalogenated Organics by Gas Chromatography*.

**Semi-Volatile Organic Chemicals:** Sample extracts will be analyzed for SVOCs using gas chromatography/mass spectrometry (GC/MS) EPA SW846 Method 8270, *Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)*.

**Volatile Organic Chemicals:** Water samples collected in 40-mL vials will be analyzed for volatile organic chemical (VOC) compounds directly by EPA SW846 Method 8260, *Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)*.

**Target Analyt List Metals and Mercury:** Samples will be analyzed for TAL metals by EPA SW848 Method 6010, *Inductively Coupled Plasma-Atomic Emission Spectrometry*. Mercury will be analyzed by EPA SW846 Method 7470, *Mercury in Liquid Waste (Manual Cold-Vapor Technique)*.

### **3.0 Data Analysis**

To determine the potential impact of the crude oil release to water quality, the results of water quality sampling (i.e., VOCs, SVOCs, GRO, DRO/ORO, and metals) will be analyzed for the presence/absence of these compounds, and should they be found, the concentrations of these parameters relative to appropriate regulatory water standards. The results of chemistry analyses from GCAL (and additional facilities as needed) will be provided to regulatory agencies as an electronic data deliverable (EDD). CTEH will coordinate EDD format with Incident Command, USEPA and the lab. Data will be posted on a CTEH web-portal and access will be provided to appropriate officials.

**ATTACHMENT 1**  
**SURFACE WATER DATA QUALITY OBJECTIVE**  
**DATA QUALITY OBJECTIVE NUMBER 1**  
**MC 252 OIL PLATFORM OIL SPILL**  
**MEDIA OF CONCERN: SURFACE WATER**

<b>STEP 1. STATE THE PROBLEM</b>	
COASTAL SURFACE WATER SAMPLES WILL BE COLLECTED AT VARIOUS LOCATIONS TO IDENTIFY SURFACE WATER WITH CONCENTRATIONS OF CHEMICALS/POLLUTANTS OF CONCERN.	
<b>STEP 2. IDENTIFY THE DECISION</b>	
ARE THE CONCENTRATIONS OF CHEMICALS OF CONCERN IN SURFACE WATER, REPRESENTED BY A SAMPLE, ABOVE SPECIFIED BENCHMARKS?	
IDENTIFY THE ALTERNATIVE ACTIONS THAT MAY BE TAKEN BASED ON THE DECISIONS.	<ul style="list-style-type: none"> <li>• If any contaminant exceeds the specified benchmark in the surface water, the media represented by that sample will be considered contaminated and will require additional attention.</li> <li>• If no contaminants exceed the specified benchmarks in surface water, the media represented by that sample will not require additional attention.</li> </ul>
<b>STEP 3. IDENTIFY INPUTS TO THE DECISION</b>	
IDENTIFY THE INFORMATIONAL INPUTS NEEDED TO RESOLVE A DECISION.	Contaminant concentrations in surface water samples collected from the Gulf of Mexico and contiguous inlets and rivers.
IDENTIFY THE SOURCES FOR EACH INFORMATIONAL INPUT AND LIST THE INPUTS THAT ARE OBTAINED THROUGH ENVIRONMENTAL MEASUREMENTS.	<ul style="list-style-type: none"> <li>• Surface water samples from Gulf of Mexico and contiguous inlets and rivers.</li> <li>• Analytical results from VOC, SVOC, metals, and TPH (GRO, DRO and ORO).</li> </ul>
BASIS FOR THE CONTAMINANT SPECIFIC ACTION LEVELS.	<ul style="list-style-type: none"> <li>• For surface water, USEPA MCLs and appropriate guidelines.</li> </ul>
IDENTIFY POTENTIAL SAMPLING TECHNIQUES AND APPROPRIATE ANALYTICAL METHODS.	<ul style="list-style-type: none"> <li>• Grab samples from the water intake source locations as identified and approved.</li> </ul>

**DATA QUALITY OBJECTIVE NUMBER 1**  
**MC 252 OIL PLATFORM OIL SPILL**  
**MEDIA OF CONCERN: SURFACE WATER (Continued)**

<b>STEP 4. DEFINE THE BOUNDARIES OF THE STUDY</b>	
DEFINE THE DOMAIN OR GEOGRAPHIC AREA WITHIN WHICH ALL DECISIONS MUST APPLY.	Locations within the states of LA, MS, AL, and FL as determined by Incident Command and USEPA.
SPECIFY THE CHARACTERISTICS THAT DEFINE THE POPULATION OF INTEREST.	Contaminant concentrations in surface water at the sample locations.
DEFINE THE SCALE OF DECISION MAKING.	The scale of decision will be for the site activities occurring at the time of the sample collection.
DETERMINE THE TIME FRAME TO WHICH THE DATA APPLY.	The analytical data will apply until the surface water represented by the sample receives appropriate response action.
DETERMINE WHEN TO COLLECT DATA.	Samples will be collected during the field sampling activities daily until concerns are alleviated
IDENTIFY PRACTICAL CONSTRAINTS ON DATA COLLECTION.	<ul style="list-style-type: none"> <li>• Inclement weather.</li> <li>• Access not attainable.</li> </ul>
<b>STEP 5. DEVELOP A DECISION RULE</b>	
SPECIFY THE PARAMETER THAT CHARACTERIZES THE POPULATION OF INTEREST.	The concentrations of chemicals/pollutants identified in surface water samples.
SPECIFY THE ACTION LEVEL FOR THE DECISION.	For surface water, USEPA recommended MCLs and MSSLS.
DEVELOP A DECISION RULE.	If any result in a surface water sample is above the contaminant specific action level or background, then the media represented by that sample may require additional attention, otherwise the surface water does not require additional attention. Additional attention means more sampling, surface water collection and treatment, or other action deemed necessary by Incident Command and USEPA.

**DATA QUALITY OBJECTIVE NUMBER 1**  
**MC 252 OIL PLATFORM OIL SPILL**  
**MEDIA OF CONCERN: SURFACE WATER (Continued)**

<b>STEP 6. SPECIFY LIMITS ON DECISION ERRORS</b>	
DETERMINE THE POSSIBLE RANGE OF THE PARAMETER OF INTEREST.	Contaminant concentrations may range from below detection in parts per trillion (ppt) for surface water to more than the contaminant specific action level.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	<u>Type I Error</u> : Deciding that the specified area represented by the surface water sample does not exceed the specified assessment level when, in truth, the surface water concentration of the contaminant exceeds its specified action level. The consequence of this decision error is that contaminated surface water will remain on-site or flow off-site, possibly endangering human health and the environment. This decision error is more severe.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	<u>Type II Error</u> : Deciding that the specified area represented by the surface water sample does exceed the specified action level when, in truth, it does not. The consequences of this decision error are that remediation of the specified area will take place and unnecessary costs will be incurred.
ESTABLISH THE TRUE STATE OF NATURE FOR EACH DECISION RULE.	The true state of nature when the surface water is decided to be below the specified action levels when in fact, it is not below the specified action levels, is that restrictions may not be necessary. The true state of nature when the surface water is decided to be above the specified action levels when in fact, it is not above the specified action levels, is that restrictions may not be necessary.
DEFINE THE TRUE STATE OF NATURE FOR THE MORE SEVERE DECISION ERROR AS THE BASELINE CONDITION OR THE NULL HYPOTHESIS ( $H_0$ ) AND DEFINE THE TRUE STATE FOR THE LESS SEVERE DECISION ERROR AS THE ALTERNATIVE HYPOTHESIS ( $H_a$ ).	$H_0$ : The surface water represented by the sample is above the specified action level. $H_a$ : The surface water represented by the sample is below the specified action level.

**DATA QUALITY OBJECTIVE NUMBER 1**  
**MC 252 OIL PLATFORM OIL SPILL**  
**MEDIA OF CONCERN: SURFACE WATER (Continued)**

ASSIGN THE TERMS "FALSE POSITIVE" AND "FALSE NEGATIVE" TO THE PROPER DECISION ERRORS.	<ul style="list-style-type: none"> <li>False Positive Error = Type I</li> <li>False Negative Error = Type II</li> </ul>
ASSIGN PROBABILITY VALUES TO POINTS ABOVE AND BELOW THE ACTION LEVEL THAT REFLECT THE ACCEPTABLE PROBABILITY FOR THE OCCURRENCES OF DECISION ERRORS.	The assignment of probability values is not applicable to these DQOs because these samples are being collected for baseline and screening purposes.
<b>STEP 7. OPTIMIZE THE DESIGN</b>	
REVIEW THE DQOs.	Surface water sample locations will be determined in the field based on flooding and potential direction of overland flow.
<b>DEVELOP GENERAL SAMPLING AND ANALYSIS DESIGN.</b> Assessing for the presence of pollutants will be accomplished by collecting surface water samples daily from identified water intakes potentially impacted by the event. The locations were determined in the field by CTEH, State Health Departments, and USEPA personnel. The samples will be shipped for laboratory analysis and methodology will be consistent with USEPA methods.	

